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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| EXAMINER |
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SHIKHMAN, MAX

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| ART UNIT | PAPER NUMBER |
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2624

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01/31/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|------------------------|--|----------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/537,209 | | VAREKAMP, CHRISTIAAN | |
| | Examiner | | Art Unit | |
| | Max Shikhman | | 2624 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>06/03/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1,3-12, 15-18 rejected under 35 U.S.C. 102(e) as being anticipated by Luo
US-PAT-NO: 6631212.

() Regarding Claim 1:

1. An image processing apparatus comprising: a first segmentation means (102,104) for segmenting one (100) or more images into an output segmentation map (Col 4 lines 36, 47.. Col 6 line 41. Col 7 line 23. Col 8 line 13, 51) including a plurality of pixel groups separated by edges including at least some false edges; (Col 6 lines 55-60, "narrow regions". Col 6 line 56.)

a filtering means (106) for filtering the segmentation map (Col 6 lines 55-60. Col 6 line 57. Col 8 line 14, "clean up the segmentation maps in item 106") to remove the false edges, (Col 6 lines 55-60, "narrow regions".)

the filtering means outputting the filtered segmentation next to a second segmentation means (120) for re-segmentation.

() Regarding Claim 3:

3. The image processing apparatus as set forth in claim 1, wherein the pixel groups (Fig 9) are initially rectangular shaped regions. (Fig 9)

() Regarding Claims 4, 15:

4. The image processing apparatus as set forth in claim 1, wherein the filtering means includes: a computing means for computing a histogram of the pixel labels inside a window surrounding a given pixel in the segmentation map; and a first determining means for determining a frequency of occurrence for each pixel label in the window.

(Col 7 lines 1-9. "most common class within an 8-neighborhood")

() Regarding Claims 5, 16:

16. The method for processing one or more images as set forth in claim 15, wherein the filtering further includes: determining a most frequently occurring label of the histogram; (Col 7 lines 1-9. "most common class")

assigning to the output pixel the pixel label with the maximum occurrence.

(Col 7 lines 1-9. "uncertain" pixels are assigned a texture that is the most common class within an 8-neighborhood)

() Regarding Claims 6, 17:

17. The method for processing one or more images as set forth in claim 16, further including when more than one label occurs with equal most frequency assigning the given pixel one of: the smallest of the equally frequent labels, and the largest of the equally frequent labels.

(Col 7 lines 1-9. "most common class within an 8-neighborhood". Col 6 line 44, "k-means". Col 8 lines 49-53.)

() Regarding Claim 7:

7. The imaging processing apparatus as set forth in claim 5, further including a tie breaking means for selecting the pixel label to be assigned to the given pixel where two or more pixel labels have the same frequency and the frequency is higher than the frequency of all other pixel labels inside the histogram. (Col 7 lines 1-9. "most common class within an 8-neighborhood". Col 6 line 44, "k-means". Col 8 lines 49-53.)

() Regarding Claim 8:

8. The image processing apparatus as set forth in claim 4, wherein the window is a square of 5x5 pixels.

(Col 7 line 36: $W_b=5$)

() Regarding Claims 9, 18:

9. The image processing apparatus as set forth in claim 1, wherein the one (100) or more images include frames of a two-dimensional video. (711)

() Regarding Claim 10:

10. A method for processing one or more images, the method including:
segmenting an image (100) into a segmentation map (Col 4 lines 36, 47. Col 6 line 41. Col 7 line 23. Col 8 line 13, 51) including a plurality of pixel groups separated by edges including at least some false edges; (Col 6 lines 55-60, "narrow regions". Col 6 line 56.)

filtering (106) the segmentation map (Col 4 lines 36, 47. Col 6 line 41. Col 7 line 23. Col 8 line 13, 51) to remove (Col 8 line 13 "cleanup") the false edges; (Col 6 lines 55-60, "narrow regions". Col 6 line 56.)

and repeating the segmenting step (120) to generate an output image. (Fig 1)

() Regarding Claim 11:

11. The method for processing one or more images as set forth in claim 10, further including repeating the region segmenting step (102,104,120) and the filtering step (106,118) a plurality of times to further refine the edges. (First time: 102, 104,106. Second time: 120,118)

() Regarding Claim 12:

12. The method for processing one or more images as set forth in claim 10; wherein the segmenting of the image is region-based. (112,122,120)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2,13,14 rejected under 35 U.S.C. 103(a) as being unpatentable over Luo US-PAT-NO: 6631212 in view of Chang US-PAT-NO: 6741655.

() Regarding Claim 2:

All limitations of Claim 2 are disclosed in Claim 13.

() Regarding Claim 13:

Luo discloses everything as described above except, the limitations of claim 13.

Chang discloses as follows.

13. The method for processing one or more images as set forth in claim 12, wherein the region-based segmenting step (Col 10 line 25, "spatial-constrained clustering algorithm 610")

uses a constant color model, the constant color model including the identification of image regions with homogeneous color. (Col 10 line 27 "a color distance smaller than a given threshold".)

As Chang discloses, in spatially-constrained color segmentation, it is desirable to segment regions based on their color; this allows object tracking. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Chang's method, spatially-constrained color segmentation, in the method of Luo, to color segment regions. This enhances object tracking in pattern recognition.

5. Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Luo US-PAT-NO: 6631212.

() Regarding Claim 14:

Luo discloses substantially the claimed invention as set forth in the discussion above for claim 1, see Fig 1.

Luo does not disclose expressly "the pixel groups are square regions of 5x5 pixels"

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use square regions of 5x5 pixels. Applicant has not disclosed that square regions of 5x5 pixels provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the groupings taught by Luo or the claimed square regions of 5x5 pixels because both groupings perform the same function of image segmentation.

Therefore, it would have been obvious to one of ordinary skill in this art to modify Luo, use square regions of 5x5 pixels, to obtain the invention as specified in claim 14.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Max Shikhman whose telephone number is (571) 270-1669. The examiner can normally be reached on Monday-Friday 8:30AM-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JINGGE WU can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Art Unit: 2624

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Max Shikhman
12.27.2007

JINGGE WU
SUPERVISORY PATENT EXAMINER

